WHAT IS CLAIMED IS:

1. An inspection method for an illumination optical system of an exposure tool, comprising:

coating a surface of an exposure target substrate with a resist film;

placing a plurality of imaging components deviating from an optical conjugate plane of a surface of the resist film;

generating a plurality of inspection patterns of the resist film having a plurality of openings, by projecting exposure beams output from a plurality of effective light sources onto the resist film via the imaging components;

measuring one of the inspection patterns as a reference image, and processing the reference image so as to provide reference image data; and

determining an abnormal inspection image by measuring inspection images of the inspection patterns and comparing a plurality of inspection image data provided by processing the inspection images with the reference image data.

2. The inspection method of Claim 1, wherein the reference image data and the inspection image data are at least one of a brightness of the inspection image of the inspection pattern and a shape of the inspection pattern.

3. The inspection method of Claim 1, wherein the abnormal inspection image occurs due to a defect including at least one

of dust, a scratch in an illumination optical system which forms the effective light source, and an aberration of the illumination optical system.

4. The inspection method of Claim 1, wherein the imaging components are a plurality of pinholes provided in an opaque film.

5. The inspection method of Claim 1, wherein the imaging components are a plurality of lenses in a lens array.

6. The inspection method of Claim 4, wherein the pinholes implement a diffraction grating having a translucent film and a transparent portion arranged in a grid pattern.

7. The inspection method of Claim 6, wherein the reference image data and the inspection image data further include a variation of a center position between at least one of the inspection patterns formed by a zeroth-order diffraction beam of the diffraction grating and an outer edge formed by a plurality of first-order diffraction beams, and a size of the outer edge.

8. A processor for inspecting an illumination optical system of an exposure tool, comprising:

a data input module configured to acquire a reference image and inspection images of a plurality of inspection patterns

of a resist film having a plurality of openings, the inspection patterns obtained by projecting exposure beams output from a plurality of effective light sources onto the resist film coated on a surface of an exposure target substrate by a plurality of imaging components, the imaging components placed so as to deviate from an optical conjugate plane of the surface of the resist film;

an image processing module configured to calculate reference image data and inspection image data from the reference image and the inspection images, respectively; and

a determination module configured to compare the inspection image data with the reference image data, so as to determine whether the inspection image data is abnormal.

9. The processor of claim 8, wherein the reference image data and the inspection image data are at least one of a brightness of the inspection image of the inspection pattern and a shape of the inspection pattern.

10. The processor of Claim 8, wherein the abnormal inspection image being due to a defect including at least one of dust, a scratch in an illumination optical system which forms the effective light source, and an aberration of the illumination optical system.

11. The processor of Claim 8, wherein the imaging components

are a plurality of pinholes provided in an opaque film.

12. The processor of Claim 1, wherein the imaging components are a plurality of lenses in a lens array.

13. The processor of Claim 11, wherein the pinholes configure a diffraction grating having a translucent film and a transparent portion arranged in a grid pattern.

14. The processor of Claim 13, wherein the reference image data and the inspection image data further include a variation of a center position between at least one of the inspection patterns formed by a zeroth-order diffraction beam of the diffraction grating and an outer edge formed by a plurality of first-order diffraction beams, and a size of the outer edge.

15. A method for manufacturing a semiconductor device, comprising:

executing an inspection processing of an exposure tool including:

coating a surface of an inspection target substrate with an inspection resist film;

placing a plurality of imaging components deviating from an optical conjugate plane of a surface of the inspection resist film;

generating a plurality of inspection patterns of

the inspection resist film having a plurality of openings, by projecting exposure beams output from a plurality of effective light sources onto the inspection resist film via the imaging components;

measuring one of the inspection patterns as a reference image, and processing the reference image so as to provide reference image data; and

determining an abnormal inspection image by measuring inspection images of the inspection patterns and comparing a plurality of inspection image data provided by processing the inspection images with the reference image data;

correcting the exposure tool by acquiring a type of defect from the abnormal inspection image when the abnormal inspection image is determined to occur;

coating a semiconductor substrate with a manufacturing resist film;

loading a manufacturing photomask and the semiconductor substrate to the exposure tool, and

subjecting the semiconductor substrate to a manufacturing process of a semiconductor device by delineating the manufacturing resist film using the manufacturing photomask.

16. The method of claim 15, wherein the reference image data and the inspection image data are at least one of a brightness of the inspection image of the inspection pattern and a shape

of the inspection pattern.

17. The method of Claim 15, wherein the abnormal inspection image being due to a defect including at least one of dust, a scratch in an illumination optical system which forms the effective light source, and an aberration of the illumination optical system.

18. The method of Claim 15, wherein the imaging components are a plurality of pinholes provided in an opaque film.

19. The method of Claim 15, wherein the imaging components are a plurality of lenses in a lens array.

20. The method of Claim 18, wherein the pinholes implement a diffraction grating having a translucent film and a transparent portion arranged in a grid pattern.